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Roll no :2021-BSE-032
Section : V-A
Course : Software Construction &
Development Lab

"LAB # 04"

1. Constructor Example 1:

```java
public class Counter {
    int counterindex;
    public Counter() {
        // TODO Auto-generated constructor stub
        counterindex = 0;
    }
    public void increase()
    {
        counterindex=counterindex+1;
    }
    public void decrease()
    {
        counterindex=counterindex-1;
    }
    int getcounterindex()
    {
        return counterindex;
    }
}
```

```java
public class Tanzeela {
    public static void main(String[] args){
        // TODO Auto_generated method stub
        Counter c1=new Counter();
        c1.increase();
        int a=c1.getcounterindex();
        c1.increase();
        int b=c1.getcounterindex();
        if (a>b)
            c1.increase();
        else c1.decrease();
        System.out.println(c1.getcounterindex());
    }
}
```

Output:

2. Constructor Example 2:

```java
© Main.java      © Tanzeela.java      © Counter.java ✕

     2 usages
1    public class Counter {
        7 usages
2        int counterindex;
        no usages
3        public Counter() {
4            // TODO Auto-generated constructor stub
5            counterindex = 0;}
        no usages
6        public Counter(int x){
7            counterindex=x;
8        }
        3 usages
9        public void increase()
10       {
11           counterindex=counterindex+1;
12       }
        1 usage
13       public void decrease()
14       {
15           counterindex=counterindex-1;}
        3 usages
16       int getcounterindex()
17       {
18           return counterindex;}
19   }
```
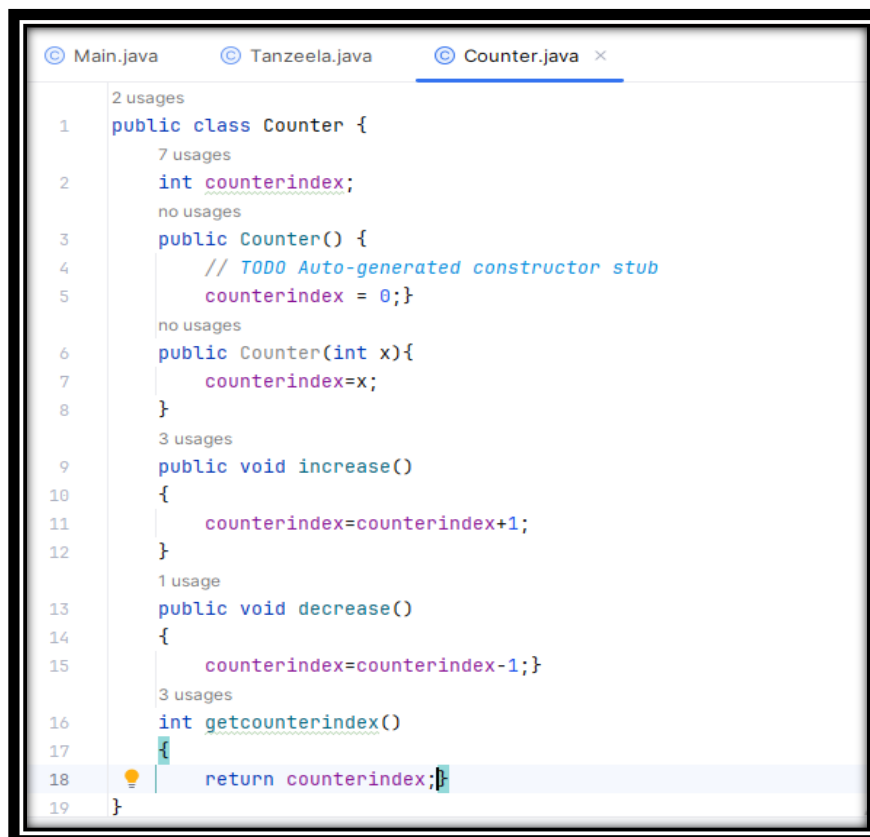
```java
  Main.java          Tanzeela.java  ×      Counter.java
1 ▷    public class Tanzeela {
2 ▷        public static void main(String[] args){
3          // TODO Auto_generated method stub
4              Counter c1=new Counter( x: 10);
5              c1.increase();
6              int a=c1.getcounterindex();
7              c1.increase();
8              int b=c1.getcounterindex();
9              if (a>b)
10                 c1.increase();
11             else
12                 c1.decrease();
13             System.out.println(c1.getcounterindex());
14         }
15     }
```

Output:

```
Run      ☐ Tanzeela  ×

G  ■  ⋮
    C:\Users\92313\.jdks\openjdk-21\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ I
↑    .jar=53856:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.2.2\bin" -Dfile.en
↓    .encoding=UTF-8 -classpath C:\Users\92313\Desktop\lab04\out\production\lab04 Tanzeela
⇶   11
≡↓
    Process finished with exit code 0
```

3. Multiple parameter constructors Example 1:

```java
1  package lab4;
2
3  public class Circle {
4      public double x,y,r;
5
6⊖     public Circle(double xcentre,double ycentre,double zcentre)
7          // TODO Auto-generated constructor stub
8          x=xcentre;
9          y=ycentre;
10         r=zcentre;
11     }
12⊖    public double circumference()
13     {
14         return 2*3.14*r;
15     }
16⊖    public double area()
17     {
18         return 3.14*r*r;
19     }
20
21 }
```

Output:

4. Multiple parameter Constructor Examples 2:

```java
1  package lab4;
2
3  public class Circle {
4      public double x,y,r;
5
6      public Circle(double xcentre,double ycentre,double zcentre) {
7          // TODO Auto-generated constructor stub
8          x=xcentre;
9          y=ycentre;
10         r=zcentre;
11     }
12     public Circle(double radius)
13     {
14         r=radius;
15     }
16     public Circle() {
17         x=0;y=0;r=0;
18     }
19     public double circumference()
20     {
21         return 2*3.14*r;
22     }
23     public double area()
24     {
25         return 3.14*r*r;
26     }
27
28 }
```

```java
1  package lab4;
2
3  public class saba1 {
4
5      public static void main(String[] args) {
6          Circle c1=new Circle(10.0,20.0,5.0);
7          Circle c2=new Circle(2.0);
8          Circle c3=new Circle();
9          // TODO Auto-generated method stub
10
11         System.out.println("Circumference = "+ c1.circumference());
12         System.out.println("Area = "+ c1.area());
13
14         System.out.println("Circumference = "+ c2.circumference());
15         System.out.println("Area = "+ c2.area());
16
17         System.out.println("Circumference = "+ c3.circumference());
18         System.out.println("Area = "+ c3.area());
19
20     }
21 }
22
```

Output:

```
<terminated> saba1 [Java Application] C:\Users\fjwu\.p2\pool\plugins
Circumference = 31.400000000000002
Area = 78.5
Circumference = 12.56
Area = 12.56
Circumference = 0.0
Area = 0.0
```
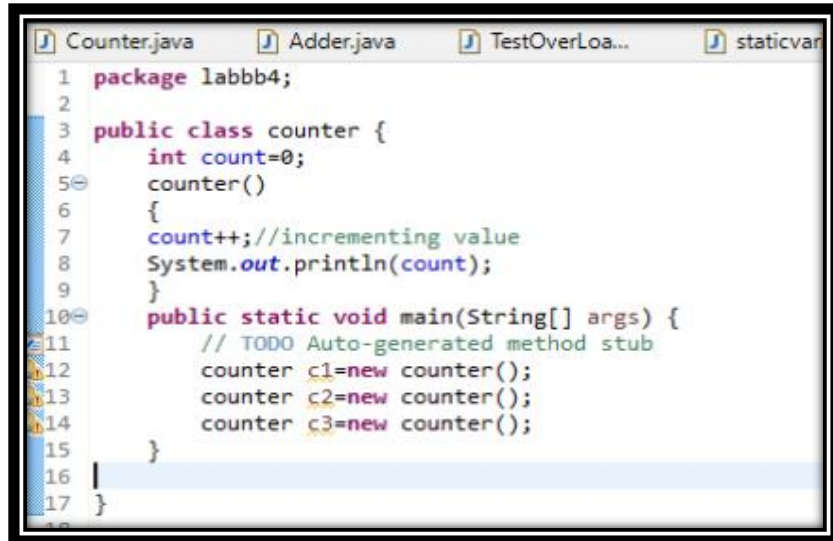
5. Method overloading Example 1:

```java
J Counter.java    J Circle.java    J Adder.java    J TestOverLoa...  X  »2
1  package labb4;
2
3  class Adder{
4      static int add(int a,int b)
5      {
6          return a+b;
7      }
8      static int add(int a,int b,int c)
9      {
10          return a+b+c;
11      }
12  }
13  class TestOverLoading {
14
15      public static void main(String[] args) {
16
17      System.out.println("Addition of 2 values = "+Adder.add(11,11));
18      System.out.println("Addition of 3 values = "+Adder.add(11,11,11)
19      }
20
21  }
```
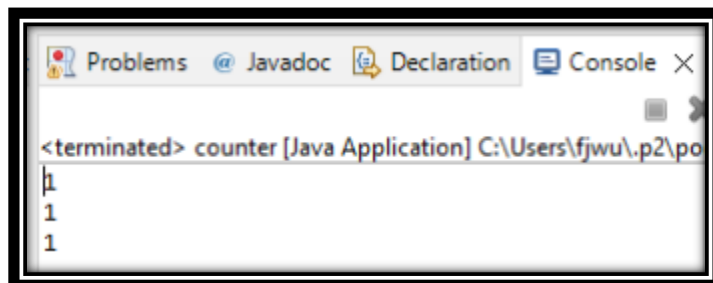
Output:

```
Problems  @ Javadoc  Declaration  Console  X
                                    X %  
<terminated> TestOverLoading [Java Application] C:\Users\fjwu\.p2\pool\plugins
Addition of 2 values = 22
Addition of 3 values = 33
```

6. Program of the counter without static variable:

```java
J Counter.java    J Adder.java    J TestOverLoa...    J staticvar
 1  package labbb4;
 2
 3  public class counter {
 4      int count=0;
 5⊖    counter()
 6      {
 7      count++;//incrementing value
 8      System.out.println(count);
 9      }
10⊖    public static void main(String[] args) {
11          // TODO Auto-generated method stub
12          counter c1=new counter();
13          counter c2=new counter();
14          counter c3=new counter();
15      }
16  |
17  }
```
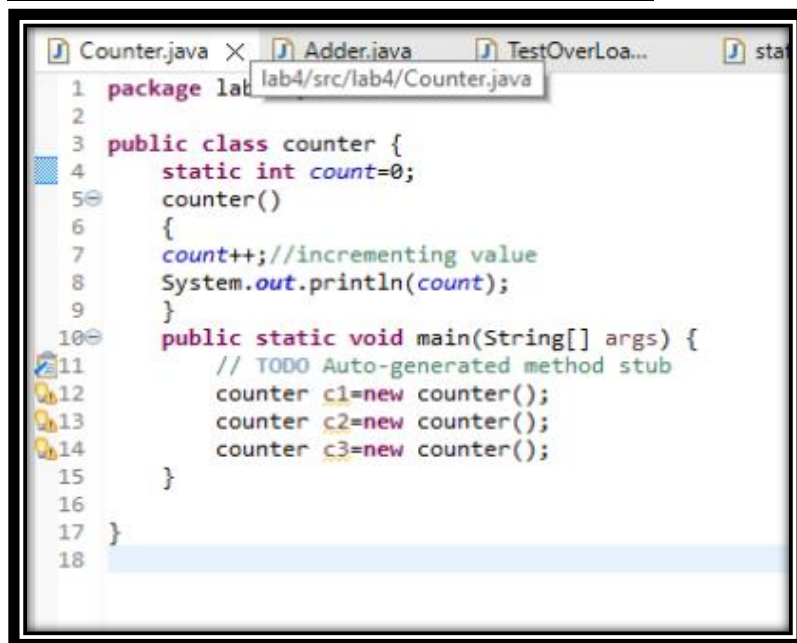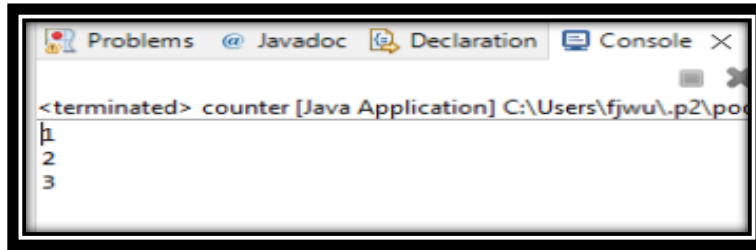
Output:

```
Problems  @ Javadoc  Declaration  Console ×

<terminated> counter [Java Application] C:\Users\fjwu\.p2\po
1
1
1
```

7. Example of counter by static variable:

```java
J Counter.java ×   J Adder.java    J TestOverLoa...    J stat
              lab4/src/lab4/Counter.java
 1  package lab
 2
 3  public class counter {
 4      static int count=0;
 5⊖    counter()
 6      {
 7      count++;//incrementing value
 8      System.out.println(count);
 9      }
10⊖    public static void main(String[] args) {
11          // TODO Auto-generated method stub
12          counter c1=new counter();
13          counter c2=new counter();
14          counter c3=new counter();
15      }
16
17  }
18
```
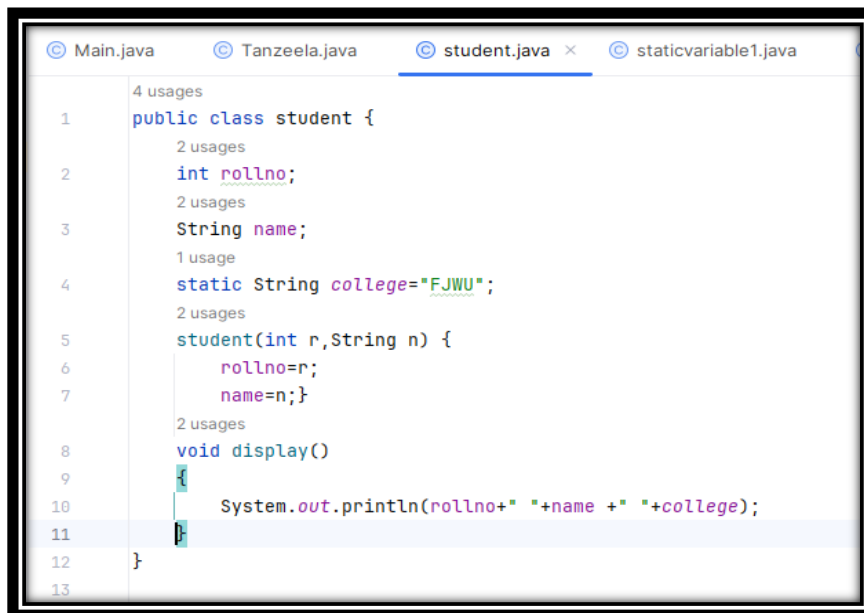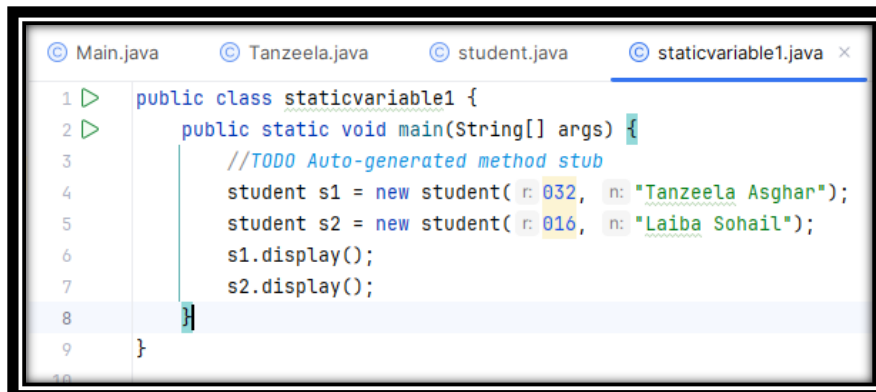
Output:

```
Problems  @ Javadoc  Declaration  Console  X

<terminated> counter [Java Application] C:\Users\fjwu\.p2\po
1
2
3
```

8. Java Static variable example 1:

```
Main.java      Tanzeela.java      student.java  X    staticvariable1.java

        4 usages
1       public class student {
            2 usages
2           int rollno;
            2 usages
3           String name;
            1 usage
4           static String college="FJWU";
            2 usages
5           student(int r,String n) {
6               rollno=r;
7               name=n;}
            2 usages
8           void display()
9           {
10              System.out.println(rollno+" "+name +" "+college);
11          }
12      }
13
```

```
Main.java      Tanzeela.java      student.java      staticvariable1.java  X

1       public class staticvariable1 {
2           public static void main(String[] args) {
3               //TODO Auto-generated method stub
4               student s1 = new student( r: 032,  n: "Tanzeela Asghar");
5               student s2 = new student( r: 016,  n: "Laiba Sohail");
6               s1.display();
7               s2.display();
8           }
9       }
10
```
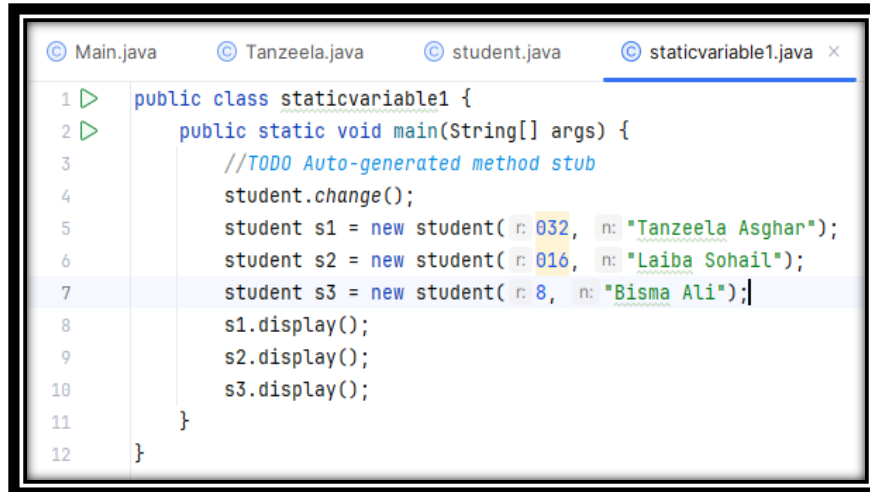
Output:

9. Static variable example 2:

```
Main.java      Tanzeela.java      student.java  ×    staticvariable1.java      Counter.java

      7 usages
1     public class student {
          2 usages
2         int rollno;
          2 usages
3         String name;
          2 usages
4         static String college="ITS";
          1 usage
5         static void change()
6         { college = "fjwu";}
          3 usages
7         student(int r,String n) {
8             rollno=r;
9             name=n;}
          3 usages
10        void display()
11        {
12            System.out.println(rollno+" "+name +" "+college);
13        }
14    }
15
```

```java
public class staticvariable1 {
    public static void main(String[] args) {
        //TODO Auto-generated method stub
        student.change();
        student s1 = new student( r: 032,  n: "Tanzeela Asghar");
        student s2 = new student( r: 016,  n: "Laiba Sohail");
        student s3 = new student( r: 8,  n: "Bisma Ali");
        s1.display();
        s2.display();
        s3.display();
    }
}
```

Output:

```
.encoding=UTF-8 -classpath C:\Users\92313\Desktop\Lab04\out\production\Lab04 staticvariable1
26 Tanzeela Asghar fjwu
14 Laiba Sohail fjwu
8 Bisma Ali fjwu

Process finished with exit code 0
```

04 > src > © staticvariable1 > ⓜ main